



# **The Twin Pandemic**

**GCC and MENA  
Obesity & Diabetes  
Report - 2015**

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## Overweight and Obesity – A Definition

Overweight and obesity are defined as abnormal or excessive fat accumulation that may impair health.

Body mass index (BMI) is a simple index of weight-for-height that is commonly used to classify overweight and obesity in adults. It is defined as a person's weight in kilograms divided by the square of his height in meters ( $\text{kg}/\text{m}^2$ ).

The WHO (World Health Organisation) definition<sup>1</sup> is:

- BMI greater than or equal to 25 is overweight
- BMI greater than or equal to 30 is obesity.

## Causes of Overweight and Obesity

The fundamental cause<sup>1</sup> of obesity and overweight is an energy imbalance between calories consumed and calories expended. Globally, there has been:

- Increased intake of energy-dense foods that are high in fat; and
- Increase in physical inactivity due to the increasingly sedentary nature of many forms of work, changing modes of transportation, and increasing urbanization.

## Common health consequences of overweight and obesity

Raised BMI is a major risk factor<sup>1</sup> for non-communicable diseases such as:

- Cardiovascular diseases (mainly heart disease and stroke),
- Diabetes;
- Musculoskeletal disorders (especially osteoarthritis - a highly disabling degenerative disease of the joints);
- Cancers (endometrial, breast, and colon).

The risk for these non-communicable diseases increases, with an increase in BMI. Childhood obesity is associated with a higher chance of obesity, premature death and disability in adulthood. But in addition to increased future risks, obese children experience breathing difficulties, increased risk of fractures, hypertension and early markers of cardiovascular disease, insulin resistance and psychological effects.

## Facing a Double Burden of Disease

Many low- and middle-income countries are now facing a "double burden" of disease.

- While they continue to deal with the problems of infectious disease and under-nutrition, they are experiencing a rapid upsurge in non-communicable disease risk factors such as obesity and overweight, particularly in urban settings.
- It is not uncommon to find under-nutrition and obesity existing side-by-side within the same country, the same community and the same household.

Children are exposed to high-fat, high-sugar, high-salt, energy-dense, micronutrient-poor foods, which tend to be lower in cost but also lower in nutrient quality. These dietary patterns in conjunction with lower levels of physical activity, result in sharp increases in childhood obesity while under nutrition issues remain unsolved.

## Prevention Methods of Overweight and Obesity

Overweight and obesity, as well as their related noncommunicable diseases, are largely preventable. At the individual level, people can:

- Limit energy intake from total fats and sugars;
- Increase consumption of fruit and vegetables, as well as legumes, whole grains and nuts;
- Engage in regular physical activity (60 minutes a day for children and 150 minutes per week for adults).

At the societal level it is important to:

- Support individuals in following the recommendations above, through sustained political commitment and the collaboration of many public and private stakeholders;
- Make regular physical activity and healthier dietary choices available, affordable and easily accessible to all - especially the poorest individuals.

The food industry can play a significant role in promoting healthy diets by:

- Reducing the fat, sugar and salt content of processed foods;
- Ensuring that healthy and nutritious choices are available and affordable to all consumers;
- Practicing responsible marketing especially those aimed at children and teenagers;
- Ensuring the availability of healthy food choices and supporting regular physical activity practice in the workplace.

## Global Weight Management Market Overview:

The global Weight Loss Management Market<sup>2</sup> was worth \$265 billion in the year 2012 and is expected to reach \$361 billion by 2017.

The Weight Management Market is divided into four segments:

### By Diet

- ✓ Meals & Meal Replacements
- ✓ Low-calorie Diet & Sweeteners
- ✓ Beverages, Low-calorie Beverages/Diet Soft Drinks
- ✓ Herbal Tea/ Green Tea
- ✓ Slimming Water
- ✓ Supplements
- ✓ Protein & Fiber
- ✓ Green Tea Extract
- ✓ Conjugate Linoleic Acid (CLA)

### By Equipment

- ✓ Fitness Equipment
  - Cardiovascular Training Equipment
  - Treadmill & Ellipticals
  - Stationery Cycles
  - Rowing machines
  - Stair steppers
- ✓ Others
  - Strength Training Equipment
  - Single & Multi Stations
  - Body Composition Analyzers
  - Fitness Monitoring Equipment
- ✓ Surgical Equipment
  - Minimally Invasive/Bariatric Equipment
    - Gastric Bypass
    - Laparoscopic Gastric Banding Systems
    - Laparoscopic Sleeve Gastrectomy
    - Biliopancreatic Diversion Surgeries
    - Revision Surgeries
  - Noninvasive Surgical Equipment
    - Intra-gastric Balloon System
    - EndoBarrier
    - Endoscopic Suturing
    - StomaphyX

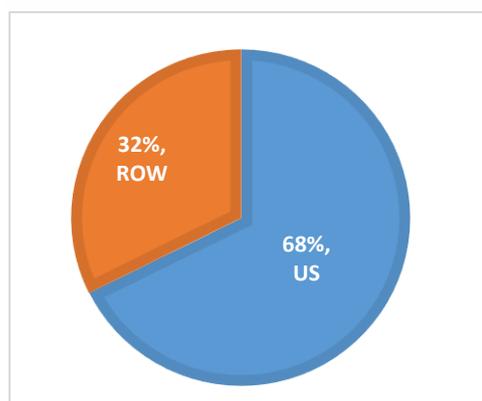
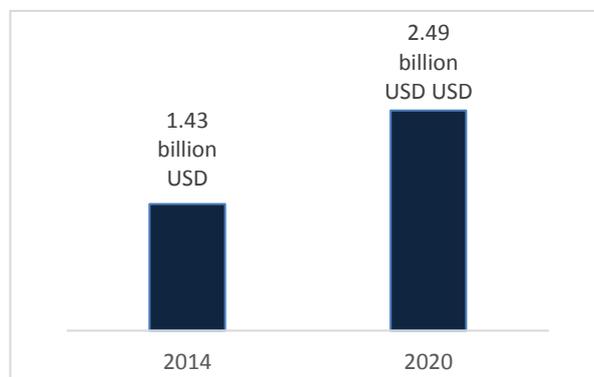
### By Service

- ✓ Fitness Centers
- ✓ Slimming Centers
- ✓ Consulting Services
- ✓ Online Weight Loss Programs

## Obesity surgical device

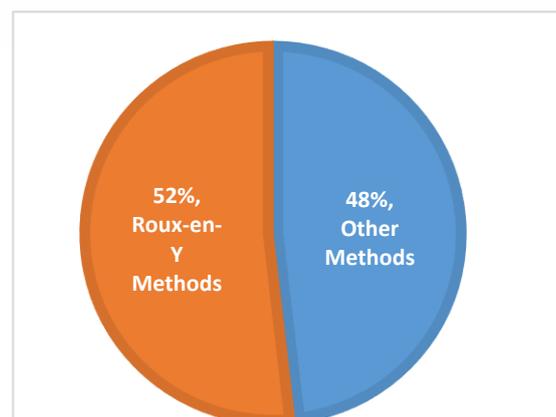
### Global Market overview

According to market research reports the global obesity surgery device market was estimated at USD 1.43 billion in 2014. It is likely to grow at a CAGR of 9.6% from 2014 to 2020 to reach USD 2.49 billion in 2020<sup>3</sup>.



The North American obesity surgery devices market was valued at USD 968 million in 2014 and is expected to reach USD 1.67 billion in 2020, growing at a CAGR of 9.4% from 2014 to 2020<sup>3</sup>.

Roux-en-Y gastric bypass procedure for obesity surgery was valued at USD 691.4 million in 2014 and is expected to reach USD 1.23 billion in 2020, growing at a CAGR of 10% from 2014 to 2020.



North America remains the largest market for global obesity surgery devices. Roux-en-Y gastric bypass is the most popular procedure of obesity surgery and staples are the most common type of obesity surgery device. In terms of growth, the Asia Pacific is the fastest growing region (including Middle East), sleeve gastrectomy is the fastest growing procedure and gastric electrical stimulation is the fastest growing type of obesity surgery device<sup>3</sup>. According to the data of International Federation for the Surgery of Obesity and Metabolic Diseases (IFSO), the total number of bariatric procedures<sup>3</sup> performed worldwide in 2013 was 468,609 and 95.7 % were carried out laparoscopically<sup>4</sup>. The highest number (n = 154,276) was from the USA/Canada region. The most commonly performed procedure in the world was Roux-en-Y gastric bypass (RYGB), 45 %; followed by sleeve gastrectomy (SG), 37 %; and adjustable gastric banding (AGB), 10 %. Most significant were the rise in prevalence of SG from 0 to 37 % of the world total from 2003 to 2013, and the fall in AGB of 68 % from its peak in 2008 to 2013<sup>4</sup>.

## Market dynamics

As per market research report, the global obesity market is projected to grow at CAGR 9.6% to US\$ 2.49 billion by 2020 from an estimated US\$ 1.43 billion in 2014. In overall market size of obesity surgery, Roux-en-Y gastric bypass procedure for obesity surgery is expected to reach USD 1.23 billion in 2020<sup>3</sup> from USD 691.4 million in 2014 and is, growing at a CAGR of 10%. The US is projected to remain the largest global market. Asia & Pacific and Latin America are expected to be the fastest growing markets, going forward.

## Market Drivers

- ✓ Increasing obesity epidemic
- ✓ Increasing sedentary lifestyle and junk food habits.
- ✓ Increasing prevalence of obesity among children and adults is posing a threat in both developed and developing nations
- ✓ Urbanisation
- ✓ Advancement in technology
- ✓ Average income

## Restraints

Inadequate insurance coverage for the procedure and excessive cost of surgery often makes it unaffordable. In addition, selective nature of obesity surgery, due to its complications, restricts growth of obesity surgery devices market.

- ✓ Physical & emotional impacts
- ✓ Cost of treatment
- ✓ Not covered by insurance and government sector
- ✓ Low awareness level

## Opportunities

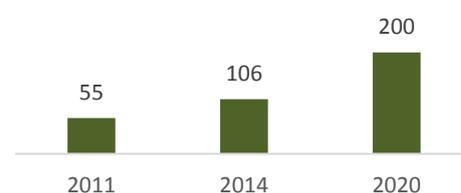
Expanding medical tourism in tandem with the increasing availability of low cost obesity treatments will likely improve awareness of people.

## Obesity Surgical device Market in MENA Region

According to secondary market research, there are approximately 120 bariatric surgery centers in 19 countries across the Middle East as of 2015. These centers have performed around a total of 50,000 bariatric surgeries. There are 10 centers performing more than 1,000 surgeries per year, 7 large centers performing from 500 to 999 obesity surgeries per year and 9 medium centers performing from 200-499 surgeries per year, 9 centers performing from 100-199 surgeries per year and 4 centers performing less than 100 surgeries per year<sup>5</sup>.

The estimated current market value of MENA region is 106 Mn USD and it will be expected to reach 200 million on 2020. UAE, KSA and Kuwait are expected to be the fastest growing markets, going forward. The demand for number of obesity surgery is expected to be 200,000 in 2020, an addition of 110,000 Obesity surgeries from 2014. The average cost of bariatric surgery is between 2,500 -15,000 USD<sup>5</sup>.

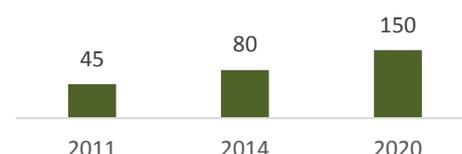
Market Value (US \$ Mn)-  
MENA Region



## Obesity Market in GCC

The estimated current market value of GCC is around 80 million USD and it will be expected to reach 150 million by 2020. UAE, KSA and Kuwait are expected to be the fastest growing markets, going forward. The demand for number of obesity surgery is expected to be 80,000 in 2020, an addition of 50,000 obesity surgeries from 2014. The average cost obesity surgery is 2,500-15,000 USD<sup>5</sup>.

Market Value (US \$ Mn) -  
GCC



## Obesity market in Kuwait

The estimated current market value of Kuwait is 20 million USD and it will be expected to reach 35 million by 2020. The demand for number of obesity surgery is expected to be 12,000 in 2020, an addition of 7,000 obesity surgeries<sup>6</sup> from 2014. The estimated average cost per obesity surgery is 2,500-15,000 USD<sup>5</sup>. And in line with the GCC averages.

Market value (US \$ Mn)-  
Kuwait



## The Potential for Obesity in the GCC

The number of obesity surgery calculated by extrapolation of obesity prevalence rate<sup>7</sup> of respective countries with % of expected obesity surgery to be done based on secondary market research, this expected value considered by % value of developed countries (UK-0.1%, US-0.15%) and developing countries (e.g. India - 0.15%, Mexico- 0.15%). Based on this the expected % obesity surgery rate will vary with GCC countries.

### Calculation based on obesity prevalence rate

Global Ranking	MENA Ranking	Country Name	Population		WHO obesity % Prevalence	No. of Obese persons	OS* conversion rate %		No. of surgeries	
			000	Total			Minium*	Actual*	Minimum	Actual
8	1	<b>Qatar</b>	1047	1046500	42.30%	442670	0.15%	1.00%	664	4427
11	2	<b>Kuwait</b>	1299	1298995	39.70%	515701	0.15%	1.50%	774	7736
13	3	<b>UAE</b>	3300	3300460	37.20%	1227771	0.15%	1.00%	1842	12278
17	4	<b>Bahrain</b>	615	614830	35.10%	215805	0.15%	0.50%	324	1079
18	5	<b>KSA</b>	20703	20702536	34.70%	7183780	0.15%	0.30%	10776	21551
20	6	Libiya	6154	6154000	33.10%	2036974	0.15%	0.05%	3055	1018
21	7	Lebnan	4647	4647000	31.69%	1472634	0.15%	0.10%	2209	1473
25	8	<b>Oman</b>	2366	2365553	30.90%	730956	0.15%	0.30%	1096	2193
26	9	Jordan	7009	7009000	30.50%	2137745	0.15%	0.05%	3207	1069
30	10	Egypt	80721	80721000	28.69%	23158855	0.15%	0.05%	34738	11579
40	11	Tunisia	10874	10874000	27.10%	2946854	0.15%	0.05%	4420	1473
50	12	Iran	76424	76424000	26.10%	19946664	0.15%	0.10%	29920	19947
60	13	Algeria	38481	38481000	24.80%	9543288	0.15%	0.05%	14315	4772
69	14	Iraq	32778	32778000	23.80%	7801164	0.15%	0.05%	11702	3901
72	15	Syrian	21889	21889000	23.50%	5143915	0.15%	0.05%	7716	2572
86	16	Morocco	32521	32521000	22.30%	7252183	0.15%	0.05%	10878	3626
120	17	Yeman	23852	23852000	17.20%	4102544	0.15%	0.05%	6154	2051
169	18	Pakistan	179160	179160000	5.20%	9316320	0.15%	0.05%	13974	4658
188	19	Afganistan	29824	29824000	2.90%	864896	0.15%	0.05%	1297	432
<b>Total</b>						<b>106040719</b>			<b>159061</b>	<b>107835</b>

Note: For GCC countries, the population considered only for nationals and excluded expats.

\*OS- Obesity surgery

\*Actual- The Actual obesity conversion rate arrived by no. of obesity surgeries done by IFCO.

\*Minimum-The Minimum obesity surgery conversion rate arrived based on US, EU, Mexico & India.

The estimated obesity surgery done at MENA based on actual conversion rate is around 110,000 surgeries in 2014. Of which GCC accounts for around 50,000 bariatric surgeries with value of 80 million USD. The estimated market value of MENA is around 110 million in 2014.

## Obesity Surgery Costs in GCC

In GCC, bariatric surgery is offered by both the government and private sector. In the government hospitals the cost of surgery is almost free for citizens (some surgeons ask for specific equipment costs to be covered) and minimum cost for expatriates however there are long waiting times and the availability of certain surgeons is limited since most surgeons also tend to work in their private clinics and many simply source potential patients from their government jobs and perform the surgeries in their private clinics for a fee. In Kuwait most advanced obesity technologies are used in hospital such as Royal Hayat, New Mouwasat, Al Salam International clinic, Alia International Clinic, London Hospital and Al Rashid Hospital.

Country	Hospital Name	Gastric bypass surgery	Sleeve Gastrectomy	Adjusted Gastric Banding	Gastric baloon
KSA	Government	6000			
KSA	Private	12000			
Dubai	Zulake Hospital	9000	9000		
Dubai	Cannadian specialist hospital	12253		8169	4000
Dubai	American acadmy hospital	12300	13700	9300	
Dubai	Cocoon center	15000		7600	3500
Abudhabi	AHALIA HOSPITAL MUSSAFAH		15000	16300	
Kuwait	Royal hayat hospital	15000	12500	9000	5000
Kuwait	Taiba hospital				7500
Qatar	Ali Ahli hospital	13000			
Qatar	Government hospitals	2000			

\*Cost- Data collected from personal communications.

## Obesity as a Global Pandemic

A new, comprehensive analysis, published in the Lancet<sup>8</sup>, paints a frightening portrait of the global obesity pandemic. Based on this report the worldwide prevalence of overweight and obesity rose by 27.5% for adults and by 47.1% for children. The result was an absolute increase from 857 million overweight and obese people in 1980 to 2.1 billion in 2013. For men, the proportion with a BMI of 25 or greater increased from 28.8% to 36.9%. For women, the proportion increased from 29.8% to 38.0%.

Although the increase was observed in every country, the patterns were different between developed and developing countries. In developed countries, there were more men than women who were overweight or obese; in developing countries, the pattern was reversed. In 2013, nearly a quarter of children and adolescents in developed countries were overweight or obese.

## The Twin pandemic: Obesity as a significant risk factor to diabetes

### Diabetes definition

Diabetes<sup>9</sup> is a chronic disease that occurs either when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces. Insulin is a hormone that regulates blood sugar. Hyperglycaemia, or raised blood sugar, is a common effect of uncontrolled diabetes and over time leads to serious damage to many of the body's systems, especially the nerves and blood vessels.

In 2014, 9% of adults 18 years and older had diabetes. In 2012 diabetes was the direct cause of 1.5 million deaths. More than 80% of diabetes deaths occur in low- and middle-income countries.

### Types of Diabetes

#### Type 1 diabetes

Type 1 diabetes<sup>9</sup> (previously known as insulin-dependent, juvenile or childhood-onset) is characterized by deficient insulin production and requires daily administration of insulin. The cause of type 1 diabetes is not known and it is not preventable with current knowledge.

Symptoms include excessive excretion of urine (polyuria), thirst (polydipsia), constant hunger, weight loss, vision changes and fatigue. These symptoms may occur suddenly.

#### Type 2 diabetes

Type 2 diabetes<sup>9</sup> (formerly called non-insulin-dependent or adult-onset) results from the body's ineffective use of insulin. Type 2 diabetes comprises 90% of people with diabetes around the world, and is largely the result of excess body weight and physical inactivity.

Symptoms may be similar to those of Type 1 diabetes, but are often less marked. As a result, the disease may be diagnosed several years after onset, once complications have already arisen.

Until recently, this type of diabetes was seen only in adults but it is now also occurring in children.

#### Gestational diabetes

Gestational diabetes<sup>9</sup> is hyperglycaemia with blood glucose values above normal but below those diagnostic of diabetes, occurring during pregnancy. Women with gestational diabetes are at an increased risk of complications during pregnancy and at delivery. They are also at increased risk of type 2 diabetes in the future.

Gestational diabetes is diagnosed through prenatal screening, rather than reported symptoms.

## Pre diabetes or impaired glucose tolerance (IGT) and impaired fasting glycaemia (IFG)

Impaired glucose tolerance (IGT) and impaired fasting glycaemia (IFG) are intermediate conditions in the transition between normality and diabetes. People with IGT or IFG are at high risk of progressing to type 2 diabetes, although this is not inevitable.

## Risk factors of Diabetes

### Type 1 Risk Factors<sup>9</sup>

This type usually starts in childhood. The pancreas stops making insulin. The main things that lead to it are:

- **Family history.** If relatives with diabetes, chances are strong do get it, too. Anyone who has a mother, father, sister, or brother with type 1 diabetes should get checked. A simple blood test can diagnose it.
- **Diseases of the pancreas.** They can slow its ability to make insulin.
- **Infection or illness.** Some infections and illnesses, mostly rare ones, can damage the pancreas.

### Type 2 Risk factors<sup>9</sup>

If body can't use the insulin it makes. This is called insulin resistance. Type 2 usually affects adults, but it can begin at any time in your life. The main things that lead to it are:

- **Obesity or being overweight.** Research shows this is a top reason for type 2 diabetes. Because of the rise in obesity among U.S. children, this type is affecting more teenagers.
- **Impaired glucose tolerance.** Pre- diabetes is a milder form of the disease that's sometimes called impaired glucose tolerance. It can be diagnosed with a simple blood test. If you have it, there's a strong chance you'll get type 2 diabetes.
- **Insulin resistance.** Type 2 diabetes often starts with cells that are resistant to insulin. That means your pancreas has to work extra hard to make enough insulin to meet your body's needs.
- **Ethnic background.** Diabetes happens more often in Hispanic/Latino Americans, African-Americans, Native Americans, Asian-Americans, Pacific Islanders, and Alaska natives.
- **High blood pressure.** That means blood pressure over 140/90.
- **Low levels** of HDL ("good") cholesterol and **high levels** of triglycerides.
- **Gestational diabetes.** If females had diabetes while they were pregnant, they had gestational diabetes. This raises their chances of getting type 2 diabetes later in life.

- **Sedentary lifestyle.** E less than three times a week.
- **Family history.** If have a parent or sibling who has diabetes.
- **Polycystic ovary syndrome.** Women with polycystic ovary syndrome (PCOS) have a higher risk.
- **Age.** If age over 45 and overweight or if you have symptoms of diabetes, talk to your doctor about a simple screening test.

## Gestational Diabetes Risk factors<sup>9</sup>

Diabetes when women's expecting affects about 4% of all U.S. pregnancies. It's caused by hormones the placenta makes or by too little insulin. High blood sugar from the mother causes high blood sugar in the baby. That can lead to growth and development problems if left untreated. Things that can lead to gestational diabetes include:

- **Obesity or being overweight.** Extra pounds can lead to gestational diabetes.
- **Glucose intolerance.** Having glucose intolerance or gestational diabetes in the past makes you more likely to get it again.
- **Family history.** If a parent or sibling has had gestational diabetes, you're more likely to get it.
- **Age.** The older people are when they get pregnant, the higher your chances are.

## Common consequences of diabetes

Over time, diabetes can damage the heart, blood vessels, eyes, kidneys, and nerves.

- Diabetes increases the risk of heart disease and stroke. In a multinational study, 50% of people with diabetes die of cardiovascular disease (primarily heart disease and stroke).
- Combined with reduced blood flow, neuropathy (nerve damage) in the feet increases the chance of foot ulcers, infection and eventual need for limb amputation.
- Diabetic retinopathy is an important cause of blindness, and occurs as a result of long-term accumulated damage to the small blood vessels in the retina. One percent of global blindness can be attributed to diabetes.
- Diabetes is among the leading causes of kidney failure.
- The overall risk of dying among people with diabetes is at least double the risk of their peers without diabetes.

## Prevention Methods

Simple lifestyle measures have been shown to be effective in preventing or delaying the onset of type 2 diabetes. To help prevent type 2 diabetes and its complications, people should:

- Achieve and maintain healthy body weight;
- Be physically active – at least 30 minutes of regular, moderate-intensity activity on most days. More activity is required for weight control;
- Eat a healthy diet of between 3 and 5 servings of fruit and vegetables a day and reduce sugar and saturated fats intake;
- Avoid tobacco use – smoking increases the risk of cardiovascular diseases.

## Diagnosis and treatment

Early diagnosis can be accomplished through relatively inexpensive blood testing.

Treatment of diabetes involves lowering blood glucose and the levels of other known risk factors that damage blood vessels. Tobacco use cessation is also important to avoid complications.

Interventions that are both cost saving and feasible in developing countries include:

- Moderate blood glucose control. People with type 1 diabetes require insulin; people with type 2 diabetes can be treated with oral medication, but may also require insulin;
- Blood pressure control;
- Foot care.

Other cost saving interventions include:

- Screening and treatment for retinopathy (which causes blindness);
- Blood lipid control (to regulate cholesterol levels);
- Screening for early signs of diabetes-related kidney disease.

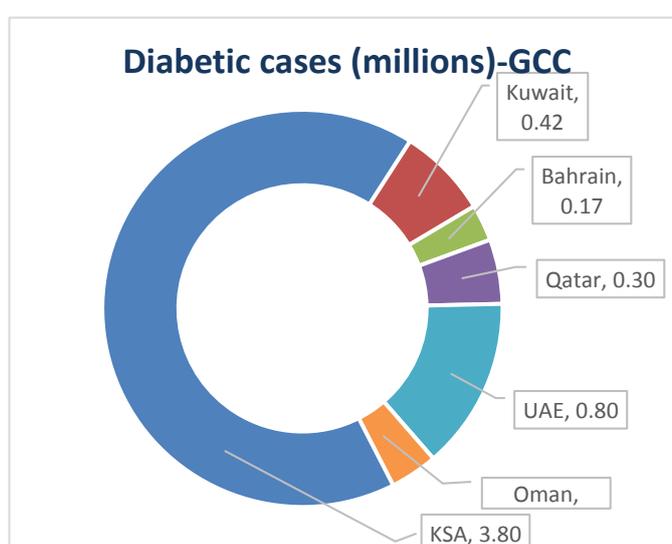
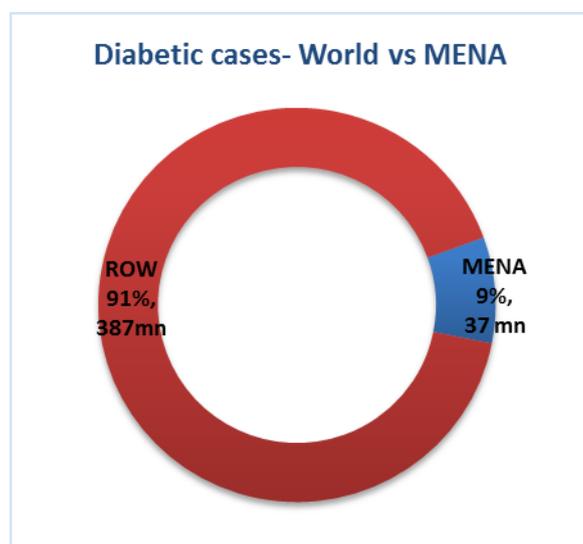
These measures should be supported by a healthy diet, regular physical activity, maintaining a normal body weight and avoiding tobacco use.

## Diabetes is now a global pandemic.

Worldwide: 387 million people – 6.4% of the adult population – have diabetes today, over 95% of whom have type 2. Each year this increases by 7 million<sup>1</sup>. By 2030, it is estimated that 438 million people will have diabetes (7.7% of the adult population) – a rise of 54% in 20 years. This total is more than the combined population of the MENA region today. Further 344 million people in 2010 have impaired glucose tolerance which can often lead to diabetes. This number, too, is expected to rise – to 472 million – by 2030. High blood glucose is the third-highest risk factor for mortality in the world, estimated to account for 5.8% of total mortality. Almost half a million children under the age of 15 have type 1 diabetes, more than half of whom live in low-and middle-income countries. Diabetes is responsible for premature death and disability on a huge scale: During 2010, diabetes will kill 10,000 people every day<sup>4</sup> or about 4 million adults each year worldwide – 6.8% of deaths from all causes. Because diabetes-related mortality is often under-reported, this is likely to be an underestimate<sup>1</sup>. Diabetes can lead to complications and severe disability, including kidney disease, blindness, heart attack, stroke and neural damage that can require limb amputation.

## Diabetics in MENA region

According to International Diabetic Federation (IDF)<sup>10</sup>, statistics on 2014., 387 million people have diabetes in the world and around 37 million people have diabetes in the MENA region, if do not act now this figure will rise to 68 million by 2035, 1 in 10 adults have diabetes, half of them have not been diagnosed and are at higher risk of developing harmful and costly complications, Diabetes will cause 363,000 deaths in 2014, 53% of those deaths were in people under the age of 60, USD 17 billion were spent on treating diabetes - only 3% of the total expenditure worldwide.



## The Potential for diabetes & its cost in the MENA

The number of diabetes treatment cost calculated by extrapolation of diabetes prevalence rate.

Diabetes presents a severe economic burden as patients with diabetes require at least 2-3 times the health care resources compared to people who do not have diabetes. The direct diabetes healthcare expenditure varies across the MENA region due to economic inequalities. In the United Arab Emirates (UAE) treatment costs are USD 1968 per person vs USD 181 in Sudan.

### Calculation based on diabetes prevalence rate

S.No.	MENA Countries	Adult population (20-79) in 1000	Diabetes cases (20-79)	Undiagnosed diabetes cases (20-79)	Diabetes national prevalence (%)	Diabetes comparative prevalence (%)	Diabetes related deaths (20-79)	Diabetes related Deaths under the age of 60 (%)	Cost per person with diabetes (USD)	Total Cost in USD million	One in X adults has diabetes
1	Saudi Arabia	18546	3806400	1549200	20.5	23.9	25527	58.5	1067.3	4062.571	5
2	Kuwait	2373	424000	172600	17.9	23.1	1232	57	1949	826.376	6
3	Bahrain	973	170600	69400	17.5	21.9	820	70.9	1195.5	203.9523	6
4	Qatar	1865	303700	123600	16.3	19.8	643	75.6	2748.2	834.6283	6
5	United Arab E	7528	803900	327200	10.7	19	1335	79.6	1967.4	1581.593	9
6	Sudan	18620	3007600	1503800	16.2	17.9	39227	69.1	180.9	544.0748	6
7	Egypt	49229	7593300	3796600	15.4	16.6	72372	47.5	213.2	1618.892	6
8	Lebanon	3443	494300	247100	14.4	14.9	6358	30.1	834.3	412.3945	7
9	Oman	2705	220600	89800	8.2	14.5	1220	53.1	1068.5	235.7111	12
10	Jordan	4256	378300	189100	8.9	11.5	3111	48.1	638.7	241.6202	11
11	Iran	53039	4581600	2290800	8.6	10	38079	42.4	722	3307.915	12
12	Libya	3826	326800	163400	8.5	9.8	2702	44.7	908	296.7344	12
13	Iraq	17107	1291200	645600	7.6	9.6	17773	54.1	399.9	516.3509	13
14	Tunisia	7547	704400	352200	9.3	9.4	5123	40.2	418.6	294.8618	11
15	State of Pales	2141	140900	70400	6.6	9.2	-	-	0	0	15
16	Syrian Arab Re	11838	875700	437900	7.4	8.8	8013	46.9	181.2	158.6768	14
17	Afghanistan	13087	805200	402600	6.2	8.1	18514	72.3	101.8	81.96936	16
18	Morocco	20844	1552200	776100	7.5	7.9	9518	42.8	289.2	448.8962	13
19	Pakistan	102125	6943800	3471900	6.8	7.9	87548	52.7	55.7	386.7697	15
20	Algeria	25215	1649100	824500	6.5	7.3	14044	46.1	422.9	697.4044	15

The economic disparity and the different prevalence of diabetes between Egypt and Saudi Arabia affects their healthcare expenditure for diabetes. Based on a large population study on global health care in diabetes, Saudi Arabia's healthcare expenditure for diabetes per person has reached USD 1068, which is around 21% of total healthcare expenditure. On the other hand, Egypt's healthcare expenditure for diabetes has reached only USD 213 per person which is around 16% of total healthcare expenditure. It is difficult to assess the exact economic burden of diabetes in each individual country across the region because not a single country has optimally

invested in accordance to the magnitude of its diabetic epidemic. Further investigations needs to be conducted to identify risk factors within the region that propagate the diabetes epidemic and optimal healthcare strategies and investments tailored specifically to each country.

### MENA region diabetes related healthcare expenditure<sup>11</sup>

When comparing OECD and GCC countries, there is a large gap in healthcare expenditure even though some GCC states surpass OECD's GDP per capita. High incomes states such as, Kuwait, the UAE, and Qatar's per capita health expenditures were USD 1500, 1640, and 1776, respectively, compared to an average of USD 4593 in OECD countries.

This underinvestment in health care is likely the responsible for diabetes being the fifth leading cause of death in 2010 in the MENA region compared with 11<sup>th</sup> place in the 1990s. Epidemiological studies have noted that in high income countries, such as Oman, only 2% of the diabetes population surveyed had their blood glucose levels controlled. Such studies indicate the dire need for MENA countries, especially the GCC states, to invest in primary healthcare, outreach programs, lifestyle coaching, and self-management education to produce long term healthy gains. This will not only enhance the longevity and quality of life of patients with diabetes but also ultimately reduce the economic burden of healthcare expenditure.

## Appendix-1: Overweight & Obesity Ranking

### GCC Vs World<sup>7</sup>

Overweight						Obesity					
GCC Ranking	World Ranking	Country Name	% of Prevalence-Both Sex			GCC Ranking	World Ranking	Country Name	% of Prevalence-Both Sex		
			Average	Low	High				Average	Low	High
1	3	Qatar	78.1	73.1	82.9	1	8	Qatar	42.3	35.9	48.4
2	6	Kuwait	75.4	71.3	79.4	2	11	Kuwait	39.7	33.8	45.3
3	10	UAE	74.0	69.6	78.3	3	13	UAE	37.2	30.9	43.4
4	13	Bahrain	71.7	67.4	76.2	4	17	Bahrain	35.1	29.9	40.7
5	15	KSA	69.6	65.1	74.4	5	18	KSA	34.7	29.6	40.1
6	21	Oman	67.4	62.8	71.9	6	25	Oman	30.9	25.5	36.4

### Top 10 countries in World<sup>7</sup>

Overweight					Obesity				
World Ranking	Country Name	% of Prevalence-Both Sex			World Ranking	Country Name	% of Prevalence-Both Sex		
		Average	Low	High			Average	Low	High
1	Cook Islan	81.0	77.6	84.8	1	Cook Islan	50.8	45.2	56.3
2	Palau	79.3	75.5	83.0	2	Palau	47.6	42.4	53.5
<b>3</b>	<b>Qatar</b>	<b>78.1</b>	<b>73.1</b>	<b>82.9</b>	3	Nauru	45.6	38.6	52.8
4	Nauru	77.8	72.6	82.9	4	Samoa	43.4	37.4	49.1
5	Marshall I.	75.8	71.3	80.0	5	Tonga	43.3	37.1	49.2
<b>6</b>	<b>Kuwait</b>	<b>75.4</b>	<b>71.3</b>	<b>79.4</b>	6	Niue	43.2	37.8	48.8
7	Niue	74.9	70.9	79.2	7	Marshall I.	42.8	37.3	48.5
8	Tonga	74.8	70.0	79.3	<b>8</b>	<b>Qatar</b>	<b>42.3</b>	<b>35.9</b>	<b>48.4</b>
9	Samoa	74.3	69.7	79.2	9	Kiribati	40.6	34.8	46.8
<b>10</b>	<b>UAE</b>	<b>74.0</b>	<b>69.6</b>	<b>78.3</b>	10	Tuvalu	40.3	34.2	46.7

## Appendix-2: Diabetes Ranking

Top 20 Countries			MENA -GCC Ranking				
S. No.	World Top 20 Country Name	CP* in %	World Ranking	MENA Ranking	GCC Ranking	Country Name	CP* in %
1.0	Marshall Islands	37.1	7	1	1	<b>KSA</b>	23.9
2.0	Micronesia	36.3	10	2	2	<b>Kuwait</b>	23.1
3.0	Tokelau	29.6	11	3	3	<b>Bahrain</b>	21.9
4.0	Kiribati	26.4	15	4	4	<b>Qatar</b>	19.8
5.0	Cook Islanda	25.5	16	5	5	<b>UAE</b>	19.0
6.0	French Polynesia	24.4	18	6		Sudan	17.9
7.0	<b>Saudi Arabia</b>	23.9	20	7		Egypt	16.6
8.0	Vanuatu	23.7	26	8		Lebanon	14.9
9.0	Nauru	23.3	29	9	6	<b>Oman</b>	14.5
10.0	<b>Kuwait</b>	23.1	52	10		Jordan	11.5
11.0	<b>Bahrain</b>	21.9	64	11		Iran	10.0
12.0	Mauritius	21.2	68	12		Libya	9.8
13.0	New Caledonia	20.1	72	13		Iraq	9.6
14.0	Guam	20.1	75	14		Tunisia	9.4
15.0	<b>Qatar</b>	19.8	83	15		Palestine	9.2
16.0	<b>United arb emirates</b>	19.0	86	16		Syrian	8.8
17.0	Palau	18.5	95	17		Yemen	8.3
18.0	Sudan	17.9	99	18		Pakistan	7.9
19.0	Malaysia	17.6	100	19		Morocco	7.9
20.0	Egypt	16.6	111	20		Algeria	7.3

\*CP- Comparative prevalence

## About Kuwait Life Sciences Company (KLSC):

KLSC focuses on healthcare innovative concepts and demanded services which have a clear and unmet need in the Middle East and North Africa (MENA) region. KLSC has been designed as an integrated healthcare company building unique projects and is considered one of the pioneer venture capitalist and private equity companies in the Middle East that invests globally and operates regionally seeking to advance healthcare services and systems within the region. KLSC supports both public and private sector stakeholders to access emerging technologies, establish unique projects and adapt best practices prevailing in today's healthcare field. KLSC operates in healthcare investment, life sciences training, medical technology and pharmaceutical distribution.

Kuwait Life Sciences (KLSC) was established in 2010, with a paid up capital of 15 million Kuwait Dinars (KD) which is equivalent to approximately \$53 million US Dollars. KLSC is fully owned by National Technology Enterprises Company. National Technology Enterprises Company (NTEC) was incorporated in November of 2002, by the Kuwait Council of Ministers as a fully owned company by the Kuwait Investment Authority (KIA), the sovereign wealth fund of the State of Kuwait. Capitalized at 100 million Kuwait Dinars (KD) which is equivalent to approximately \$350 million US Dollars, NTEC aims to play a vital role in servicing major stakeholders in Kuwait and the Middle East region with their technology requirements.

## About the Author:

Dr. Razouki is the current Chief Business Development Officer of Kuwait Life Sciences Company (KLSC) where he is responsible for identifying new business opportunities for all KLSC subsidiary companies as well as sourcing investments opportunities for KLSC.

An Oral and Maxillofacial surgeon by training, Dr. Razouki has completed clinical rotations at the world's top hospitals including New York Presbyterian Hospital of Columbia University Medical Center, Harlem Hospital, Cleveland University Hospital of Case Western Reserve University and Mass General Hospital of Harvard University.

A graduate of Columbia Business School, Dr. Razouki is the first ever Arab national to receive an MBA with a focus on Healthcare Management and Finance.

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